REARING MANTISPA VIRIDIS WALKER IN THE LABORATORY (NEUROPTERA, MANTISPIDAE) [1]

JOHN A. DAVIDSON [2, 3]

Few detailed biological observations of the genus *Mantispa* have been recorded in the literature. Brauer (1869), studying *Mantispa styriaca* Poda, was among the first to publish such on the hypermetamorphosis of mantispids. McKeown and Mincham (1948) presented a comprehensive account of the biology of *M. vittata* Guerin in Australia. In contrast to the work reported herein they were unable to rear larvae found in the fall, while larvae found in the spring could be reared. They found egg incubation varied from 16–40 days. Lucchese (1955, 1956) detailed the biology of *M. perla* Pallas along with descriptions of the first instar and adult. Peterson (1951) presented a dorsal view of *M. interrupta* Say without setae. Parfin (1958) gave a host record synopsis for the Mantispidae along with longevity notes including 81 days for one female *M. viridis* Walker.

On 4 October one female *Mantispa viridis* was collected by sweeping at Carderock, Maryland. Although kept in a glass vial at room temperature with neither food nor water she produced 528 stalked eggs six days later. Of this total 46 eggs never showed signs of embryonic development, 28 developed embryos which failed to hatch, and 453 eclosed 10 days later; an 86% hatch. For several hours following eclosion the majority of the first instar larvae remained motionless among the cluster of eggs. No instances of egg destruction or canabalism were noted in this stage.

Rearing was begun with 24 first instar *M. viridis* larvae (Fig. 3) which were placed in glass covered microsyracuse dishes to which food was added as needed. Before feeding began they were extremely active in their search for food. After feeding began they became highly distended and soon mobility was lost allowing easy manipulation. Two cases of canabalism were noted, shortly after the appearance of the second instars. Thereafter each larva was reared separately.

The first food presented consisted of spider eggs removed from the egg case of a species of Theridiidae. Although well developed spiderlings could be seen within the choria, the first instar larvae soon attached themselves and began feeding. Each larva first penetrated the egg chorion and then

[1] Scientific Article No. A1481, Contribution No. 4119, of the Maryland Agricultural Experiment Station, Department of Entomology.

[2] Department of Entomology, University of Maryland, College Park, Maryland 20742.

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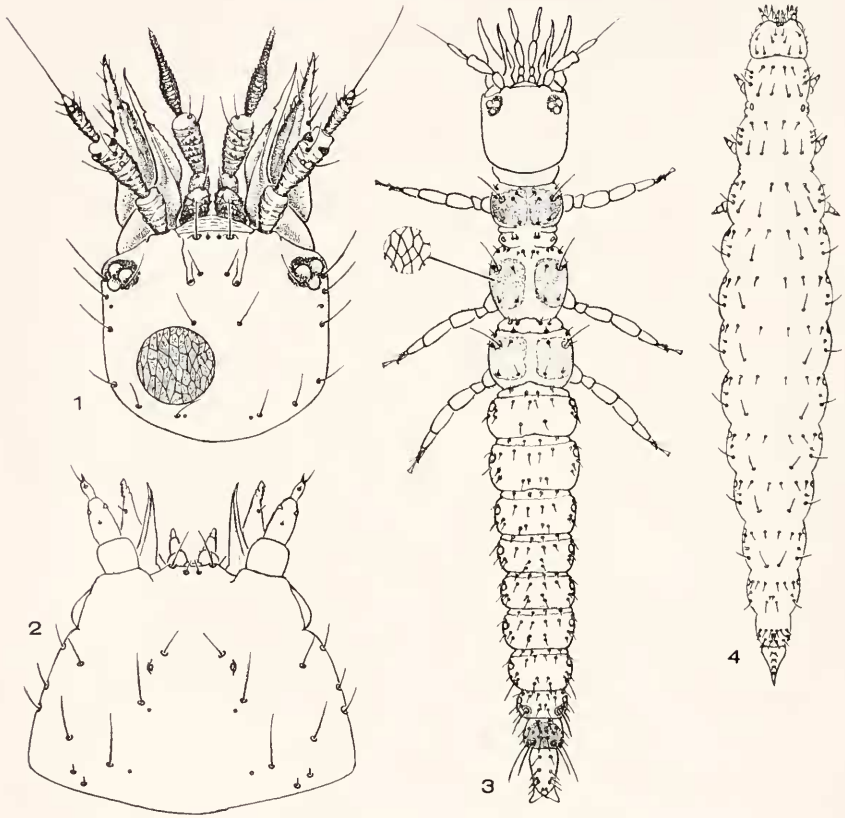
the abdomen of the spiderling. Each larva remained attached for one or more hours until all available body fluids had been sucked from the unborn host. At the end of the first instar each larva was distended approximately three times its original size.



FIGS. 1–4. *Mantispa viridis* Walker: 1, dorsal view of first instar head; 2, dorsal view of second instar head; 3, dorsal view of first instar larva; 4, dorsal view of fourth instar larva.

Second instar larvae (Fig. 4) appeared six days after eclosion. There was a notable reduction in the length of the head and its appendages, particularly the labial palps, between the first instar (Fig. 1) and the second instar (Fig. 2). In addition the eyes and sclerotized areas were lost and the legs much reduced. The body of the second instar was also much thicker and ended in a point. The second instar larvae were fed eggs of the long-bodied cellar spider, *Pholcus phalangioides* (Fuesslin), Pholcidae.

Third instar larvae resemble second instar larvae in general appearance. Pupation occurs within the exuvium of the third instar which is shed in fragments. Third instar larvae were also fed spider eggs (*P. phalangioides*) but not enough eggs were available to satisfy the requirements of the mantispid larvae. A search was begun for a substitute food.

The third instar larvae remained unfed for four days following their last feeding of spider eggs. On the fifth day each larva was given a second instar cabbage looper which had been reared on artificial media. It was necessary to crush the looper's head to render it motionless. While the mantispids probed the looper larvae with their mouthparts, they appeared unable to penetrate the cuticle. Therefore each looper was pierced with a probe and the wound presented to a mantispid larva. Feeding began immediately and continued for two or more hours until the loopers appeared dehydrated. Two days later loopers were again fed to the mantispids in the same manner.

The major drawback of this procedure lies in the fact that escaping body fluids dry and tend to cement the looper to the head of the mantispid larva. The looper must then be carefully cut away from the mantispid.

Shortly after the second feeding of loopers the mantispids began cocoon spinning, with the pure white silk issuing from the anus. At this time the head and thoracic regions of the larvae appeared greatly enlarged. The flimsy cocoons were all completed in less than six hours. The cocoons were then removed so that pupation could be observed. Eight pupae were produced from the original 24 larvae but only three adults emerged. It is believed dehydration caused the death of the remaining pupae.

The average life cycle in the laboratory at room temperature from egg to adult required 50 days and may be summarized as follows:

Incubation period, 10 days; first instar, 5–7 days; second instar, 5–9 days; third instar, 11–13 days; pupal period, 15 days.

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